

The spectacular growth in the use of glyphosate following the introduction of genetically modified, glyphosate-resistant crops in 1996 was facilitated by early reports of very low mammalian toxicity (e.g., WHO, 1996). The identified mode of action of blocking a key metabolic pathway that exists in plants, fungi, and bacteria, but not in animals supported the assertion that mammals and other higher order living organisms are unlikely to be affected (Székács and Darvas, 2012). In recent years as worldwide adoption rates of herbicide-resistant crops have risen (Duke and Powles, 2009), as an increasing number of scientific studies have raised concerns about glyphosate's safety, and as glyphosate-resistant weeds have evolved, there have been calls for glyphosate-containing herbicides to be banned or otherwise restricted. Questions regarding the safety of glyphosate, however, cannot be disentangled from more generalized opposition to genetically modified crops.

In recent years as worldwide adoption rates of herbicide-resistant crops have risen (Duke and Powles, 2009) the use of glyphosate has increased markedly and glyphosate-resistant weeds have evolved. Calls for glyphosate-containing herbicides to be banned or otherwise restricted have arisen from a number of viewpoints: due to the development of resistance; as part of a generalized opposition to genetically modified crops; or due to health concerns.

Despite the mounting calls for restriction and various reports by environmental advocacy groups that nations such as the Netherlands, Brazil, France, Russia, Mexico, El Salvador and others have banned glyphosate, very few actions have been taken. In March of 2014, Sri Lanka instituted a partial ban based on an increasing number of cases of chronic kidney disease among agricultural workers, but the ban was lifted two months later (ColomboPage, 2014). Also in 2014, France's agriculture ministry banned the sale and cultivation of the only variety of glyphosate-resistant maize currently authorized in the European Union (Reuters, 2014). Brazil is widely reported as having proposed a ban (RT.com, 2014), but no action has yet been taken. Far short of a ban, Health Canada has proposed updating product labels with additional guidance on safe product use (Health Canada, 2015), and the U.S. Environmental Protection Agency will soon require a weed resistance management plan (which does not address human health concerns) (Gillam, 2015).

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